PC/SeaTalk/NMEA Interface Box

Owner's Handbook

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Preface

Important information

Safety notices

WARNING: Product installation & operation

This equipment must be installed and operated in accordance with the Raymarine instructions provided. Failure to do so could result in personal injury, damage to your boat and/or poor product performance.

WARNING: Electrical safety

Make sure you have switched off the power supply before you start installing this product.

WARNING:

Although we have designed this product to be accurate and reliable, many factors can affect its performance. Therefore, it should serve only as an aid to navigation and should never replace commonsense and navigational judgement. Always maintain a permanent watch so you can respond to situations as they develop.

EMC conformance

All Raymarine equipment and accessories are designed to the best industry standards for use in the recreational marine environment.

The design and manufacture of Raymarine equipment and accessories conform to the appropriate Electromagnetic Compatibility (EMC) standards, but correct installation is required to ensure that performance is not compromised.

Waste from Electrical and Electronic Equipment (WEEE) Directive

The Waste from Electrical and Electronic Equipment (WEEE) Directive requires the recycling of waste electrical and electronic equipment. Whilst the WEEE Directive does not apply to some of Raymarine's products, we support its policy and ask you to be aware of how to dispose of this product.

The crossed out wheelie bin symbol, illustrated above, and found on our products signifies that this product should not be disposed of in general waste or landfill.

Please contact your local dealer, national distributor or Raymarine Technical Services for information on product disposal.

Handbook information

To the best of our knowledge, the information in this handbook was correct when it went to press. However, Raymarine cannot accept liability for any inaccuracies or omissions it may contain.

In addition, our policy of continuous product improvement may change specifications without notice. Therefore, Raymarine cannot accept liability for any differences between the product and the handbook.

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Chapter 1: Introduction

SeaTalk is the language used by Raymarine products to share information. This is unique to Raymarine. The PC/SeaTalk/NMEA Interface, by providing conversion between SeaTalk, RayTech PC and NMEA 0183 data formats, allows operation with other manufacturer's equipment and with PCs.

The PC/SeaTalk/NMEA Interface provides:

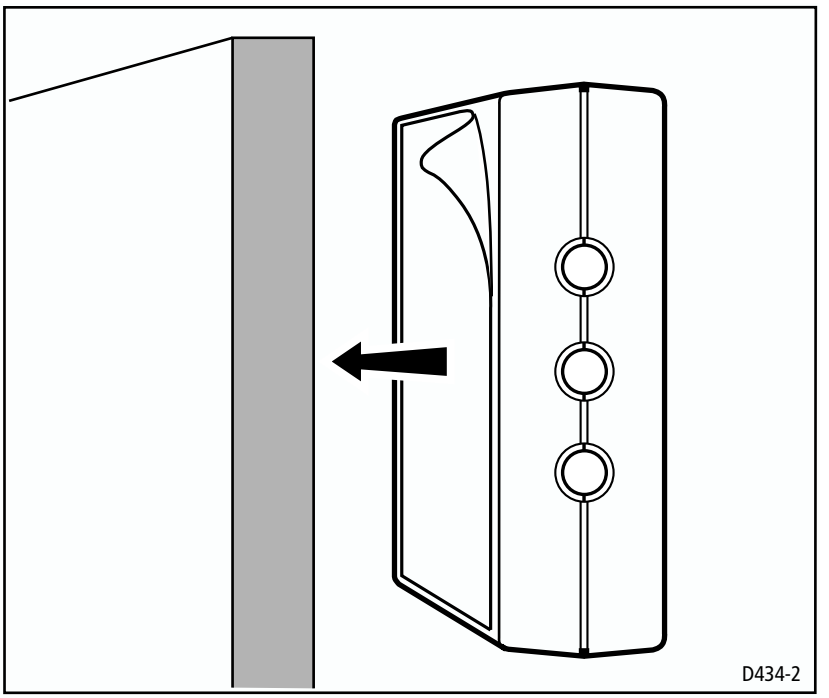
- Connection of SeaTalk to a PC running RayTech
- Conversion of NMEA 0183 data format to SeaTalk
- Conversion of SeaTalk to NMEA 0183 format
- Operation of the Raymarine Main Alarm when an alarm condition exists on the SeaTalk bus

Chapter 2: Mounting

Select a suitable location that is:

- away from direct contact with water
- clean and grease-free
- accessible for cabling
- reasonably well protected from physical damage.

1. Once a suitable location has been found, thoroughly clean the surface with an alcohol based cleaner.
2. Remove the protective backing from the PC/SeaTalk/NMEA Interface box and firmly press onto the mounting surface.



3. Alternatively, the PC/SeaTalk/NMEA Interface box may be attached using the 2 self tapping screws provided.

4. Remove the top of the Interface box by squeezing the lid at each end and pull away from the base.
5. Route all the necessary cables into the Interface box.
6. Connect the wires as described in Chapter 3. Also, secure cables close to the unit.

Chapter 3: Operation/Wiring

EMC Installation Guidelines

All Raymarine equipment and accessories are designed to the best industry standards for use in the leisure marine environment.

Their design and manufacture conforms to the appropriate Electromagnetic Compatibility (EMC) standards, but correct installation is required to ensure that performance is not compromised. Although every effort has been taken to ensure that they will perform under all conditions, it is important to understand what factors could affect the operation of the product.

The guidelines given here describe the conditions for optimum EMC performance, but it is recognized that it may not be possible to meet all of these conditions in all situations. To ensure the best possible conditions for EMC performance within the constraints imposed by any location, always ensure the maximum separation possible between different items of electrical equipment.

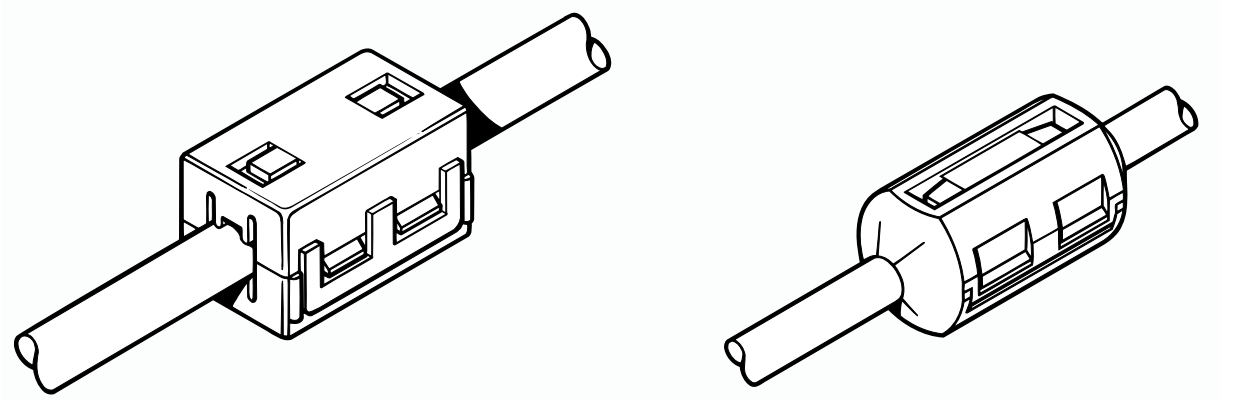
For optimum EMC performance, it is recommended that wherever possible:

- Raymarine equipment and cables connected to it are:
    - At least 1 m (3 ft.) from any equipment transmitting or cables carrying radio signals e.g. VHF radios, cables and antennas. In the case of SSB radios, the distance should be increased to 2 m (7 ft.).
    - More than 2 m (7 ft.) from the path of a radar beam. A radar beam can normally be assumed to spread 20 degrees above and below the radiating element.
- The equipment is supplied from a separate battery from that used for engine start. Voltage drops below 10 V in the power

supply to our products, and starter motor transients, can cause the equipment to reset. This will not damage the equipment, but may cause the loss of some information and may change the operating mode.

- Raymarine specified cables are used at all times. Cutting and rejoining these cables can compromise EMC performance and so must be avoided unless doing so is detailed in the installation manual.
- If a suppression ferrite is attached to a cable, this ferrite should not be removed. If the ferrite needs to be removed during installation it must be reassembled in the same position.

The following illustration shows typical cable suppression ferrites fitted to Raymarine equipment. Always use the ferrites supplied by Raymarine.



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Connections to Other Equipment

If your Raymarine equipment is to be connected to other equipment using a cable not supplied by Raymarine, a

suppression ferrite MUST always be fitted to the cable close to the Raymarine unit.

EMC Conformance

Always check the installation before going to sea to make sure that it is not affected by radio transmissions, engine starting etc.

3.1 NMEA Output

Provided you have the appropriate SeaTalk instrumentation, the data listed below is transmitted in NMEA 0183 format for use with non-SeaTalk equipment.

Note: *NMEA is also output in response to NMEA input.*

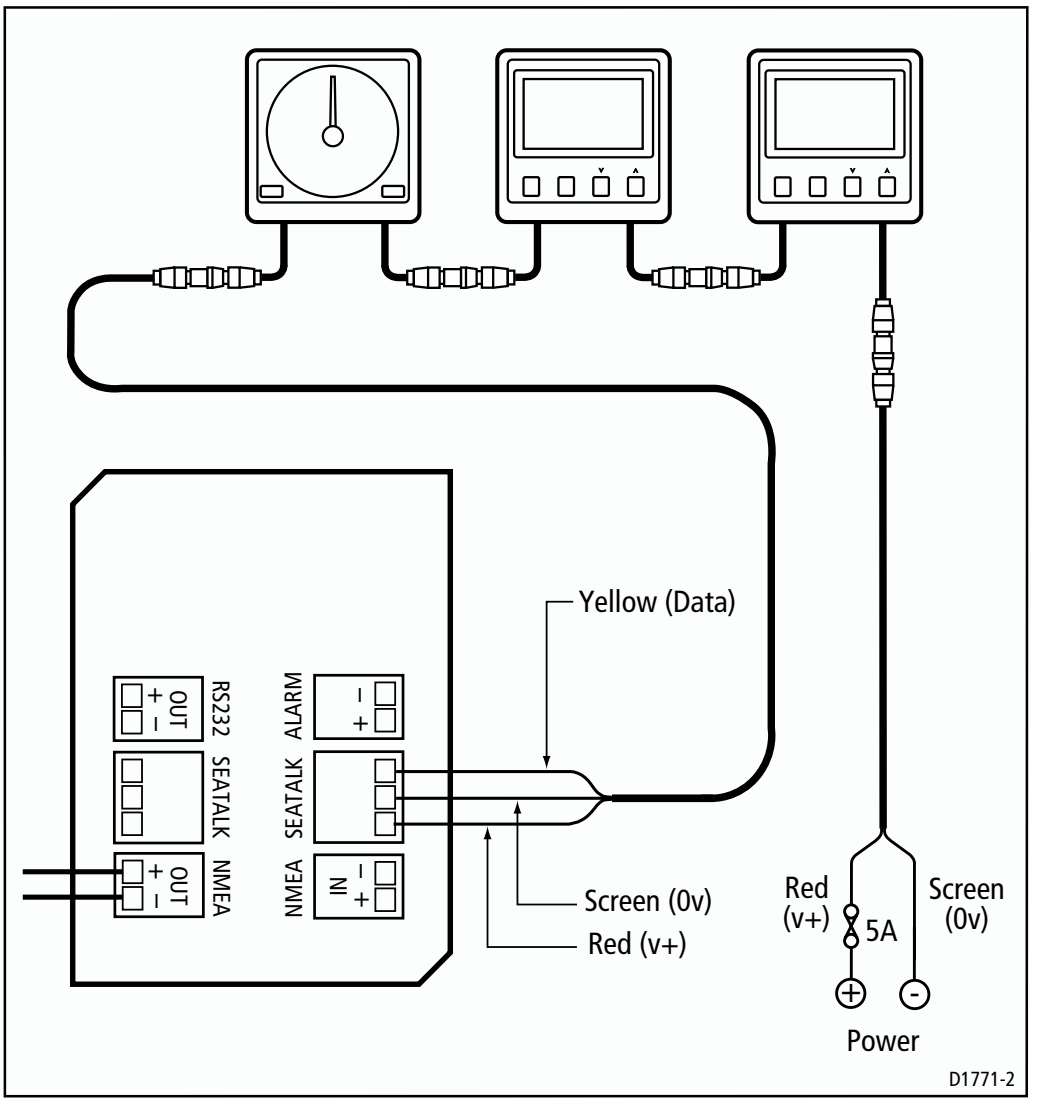
Data	Transmitted NMEA Header
Apparent Wind Angle	MWV, VWR
Apparent Wind Speed	MWV, VWR
Bearing to Waypoint	BWC, APB
Course Over Ground (M)	VTG
Cross Track Error	APB, XTE
Date	ZDA
Depth	DBT
Distance (Log)	VLW
Distance (Trip)	VLW
GPS Fix/No Fix	GGA, GLL
GPS HDOP	GSA, GGA
GPS PDOP	GSA
GPS Satellite Azimuth	GSV
GPS Satellite Elevation	GSV
GPS Satellite PR Number	GSV
GPS Satellite SNR	GSV
GPS Differential Station ID	GGA
GPS Differential AGE	GGA
GPS Number of Satellites	GGA
GPS Antenna Height	GGA

Data	NMEA Header
GPS Quality Indicator	GGA
Heading (Magnetic or True)	HDM, HDG, VHW, HDT
Latitude & Longitude	GGA, GLL*
Locked Heading	HSC
MOB (Cancel)	PNATA
Rudder Angle	RSA
Speed Over Ground	VTG
Speed Through water	VHW
Temperature, Water	MTW
Time	ZDA
Time Offset	ZTG
True Wind Angle	MWV, VWT
True Wind Direction	MWD
True Wind Speed	MWV, VWT, MWD
Variation	HDG
Waypoint Capture	WPL
Velocity Made Good to Wind	VPW
Waypoint Capture	WPL
Waypoint Destination No.	APB, BWC
Waypoint Arrival Alarm	APB, AAM
Waypoint Distance	BWC
Waypoint Time To Go	ZTG

* GLL version 1.5 is transmitted if version 1.5 is received via NMEA. If GLL version 2.0 is received via NMEA, GLL version 2.0 will be transmitted.

Cabling

The PC/SeaTalk/NMEA Interface should be connected to SeaTalk and the other manufacturer's equipment as follows:



3.2 NMEA Input

The PC/SeaTalk/NMEA Interface can also be used to convert NMEA 0183 data to SeaTalk. NMEA 0183 data is also re-transmitted on NMEA "OUT" in response to NMEA "IN". This allows non-SeaTalk equipment to be connected directly to the SeaTalk bus.

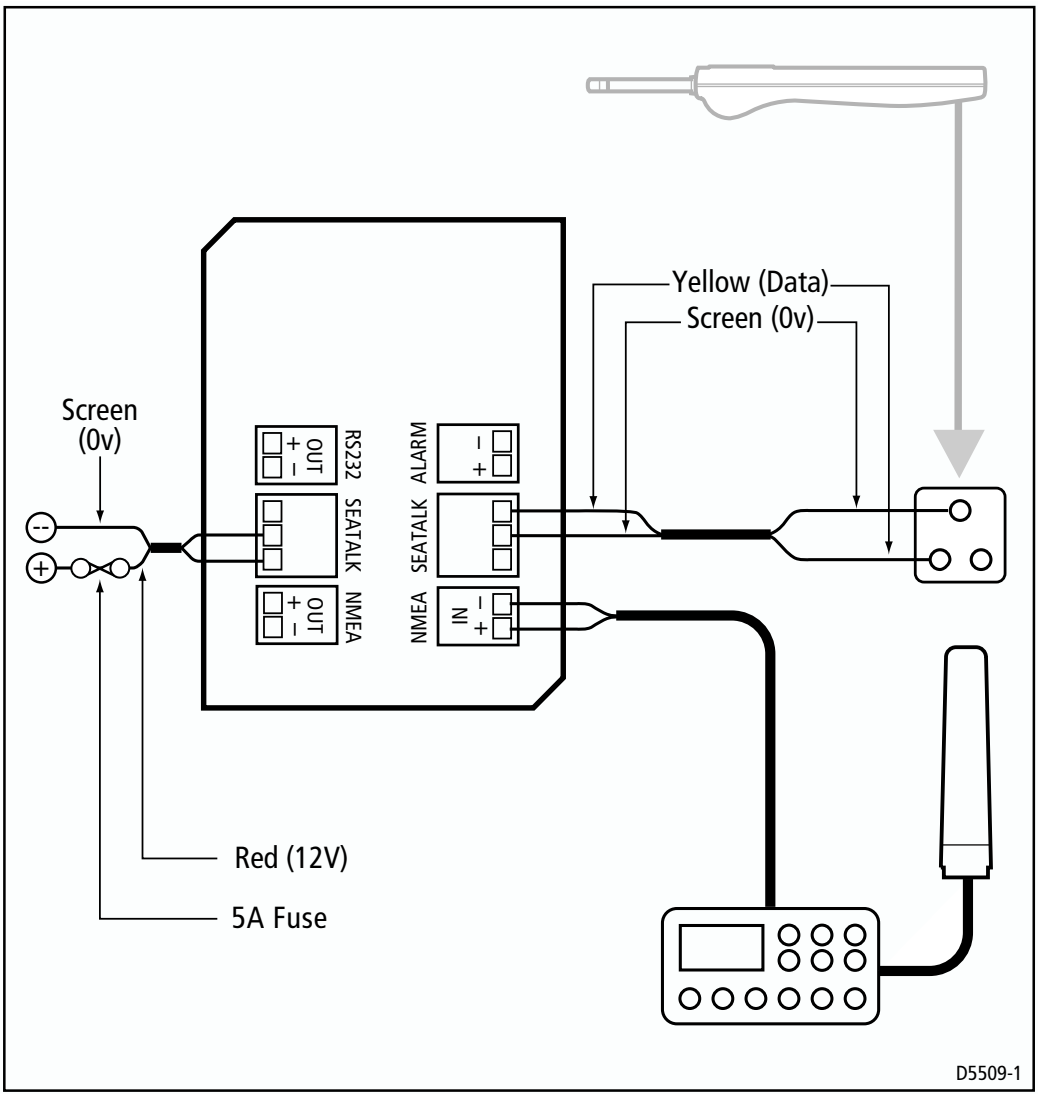
Note: *Data will not be transmitted to SeaTalk if it is already on present on the SeaTalk bus.*

Data Header	**Received NMEA**
Apparent Wind Angle	MWV, VWR
Apparent Wind Speed	MWV, VWR
Bearing to Waypoint	APB, BWR, BWC, RMB, BER, BEC
Course Over Ground (M)	VTG, VTA, RMC, RMA
Cross Track Error	APB, XTE, APA, RMB, XTR
Date	ZDA, RMC
Depth	DBT, DPT
Distance (Log)	VLW
Distance (Trip)	VLW
GPS Fix/No Fix	GGA, GSA
GPS HDOP	GGA, GSA
GPS PDOP	GSA
GPS Satellite Azimuth	GSV
GPS Satellite Elevation	GSV
GPS Satellite PR Number	GSV

Data	**NMEA Header**
GPS Satellite SNR	GSV
GPS Differential Station ID	GGA
GPS Differential AGE	GGA
GPS Number of Satellites	GGA
GPS Antenna Height	GGA
GPS Quality Indicator	GGA
Heading (Magnetic or True)	HDM, HDG, VHW, HDT
Latitude & Longitude	GGA, GLL (inc. Version 1.5)
	RMC, RMA, IMA, GLP, GOP, GXP, GDP
MOB (Cancel)	PNATA
Route	WPL
Speed Over Ground	VTG, VTA, RMC, RMA
Speed Through water	VHW
Temperature, Water	MTW
Time	ZDA, GLL, ZFO, ZTG
True Wind Angle	MWV
Variation	HDG, HVM, RMC, RMA, HVD
Waypoint Destination No.	APB, BWR, BWC, RMB, BOD, WCV, BER, BEC
Waypoint Arrival Alarm	APB, APA, AAM
Waypoint Distance	BWC, BWR

	RMB, BER, BEC
Waypoint Lat & Lon	BWC, BWR, BEC, BER
Waypoint Capture	WPL
Waypoints, last one & next 4	PNATA

Cabling (ST1,2,3000 autopilots)



3.3 Main Alarm

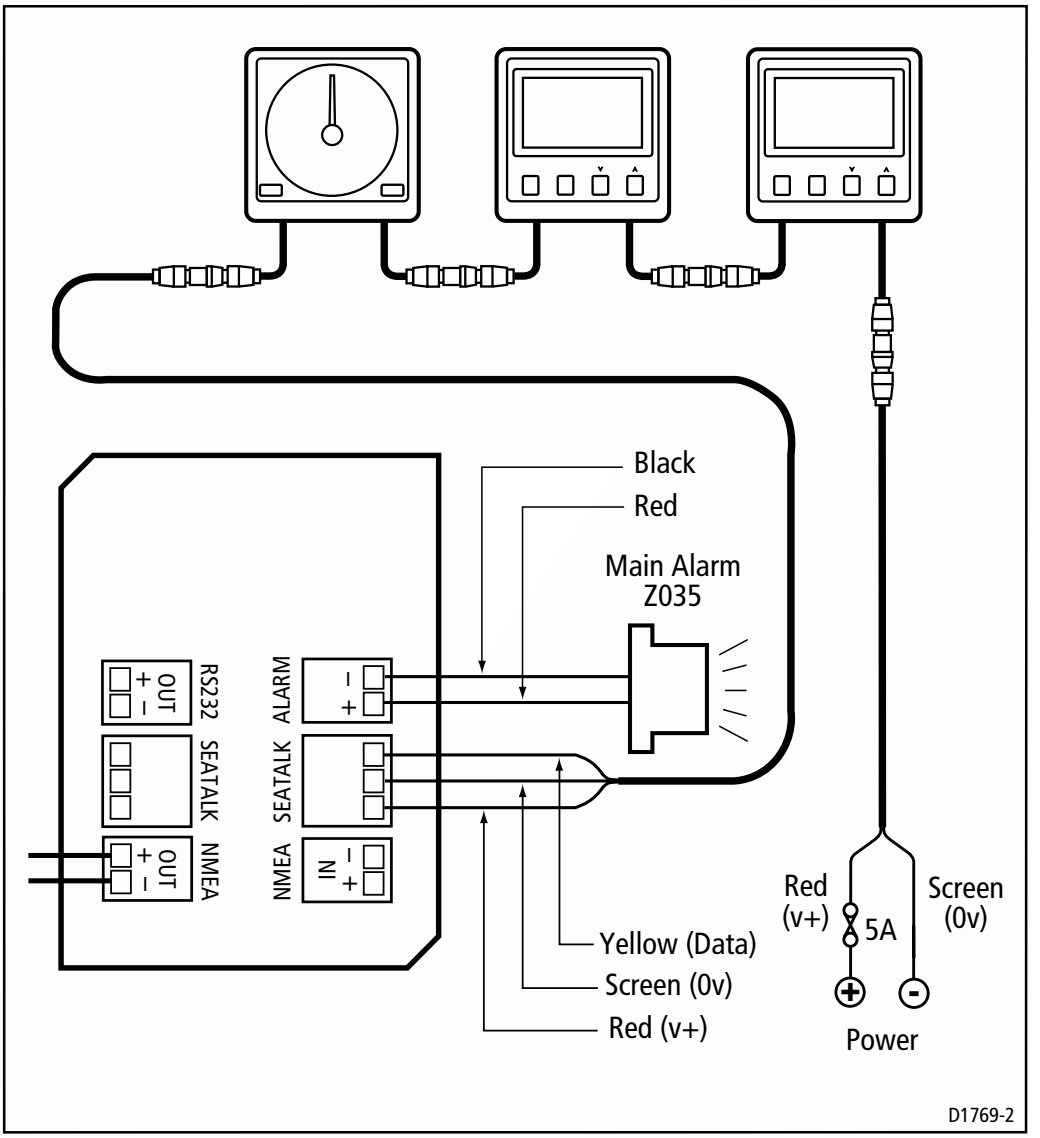
The PC/SeaTalk/NMEA Interface can be used to drive the Raymarine Main Alarm (Cat No Z035). This alarm will sound as soon as one of the following alarms is present on the SeaTalk bus:

- Deep Depth
- Shallow Depth
- Autopilot off course
- Watch alarm*
- Wind shift*
- Low battery*
- Large Cross Track Error*
- No NMEA data*
- NMEA Data error*
- No autopilot Main power
- No autopilot actuator (Drive stopped)*
- Radar Guard Zone Alarm
- Stern drive auto release
- Waypoint advance*
- Wind alarm

*The Main Alarm will sound 30 seconds after the instrument alarm.
This allows the alarm condition to be cancelled and, therefore, avoiding sounding of the main alarm.

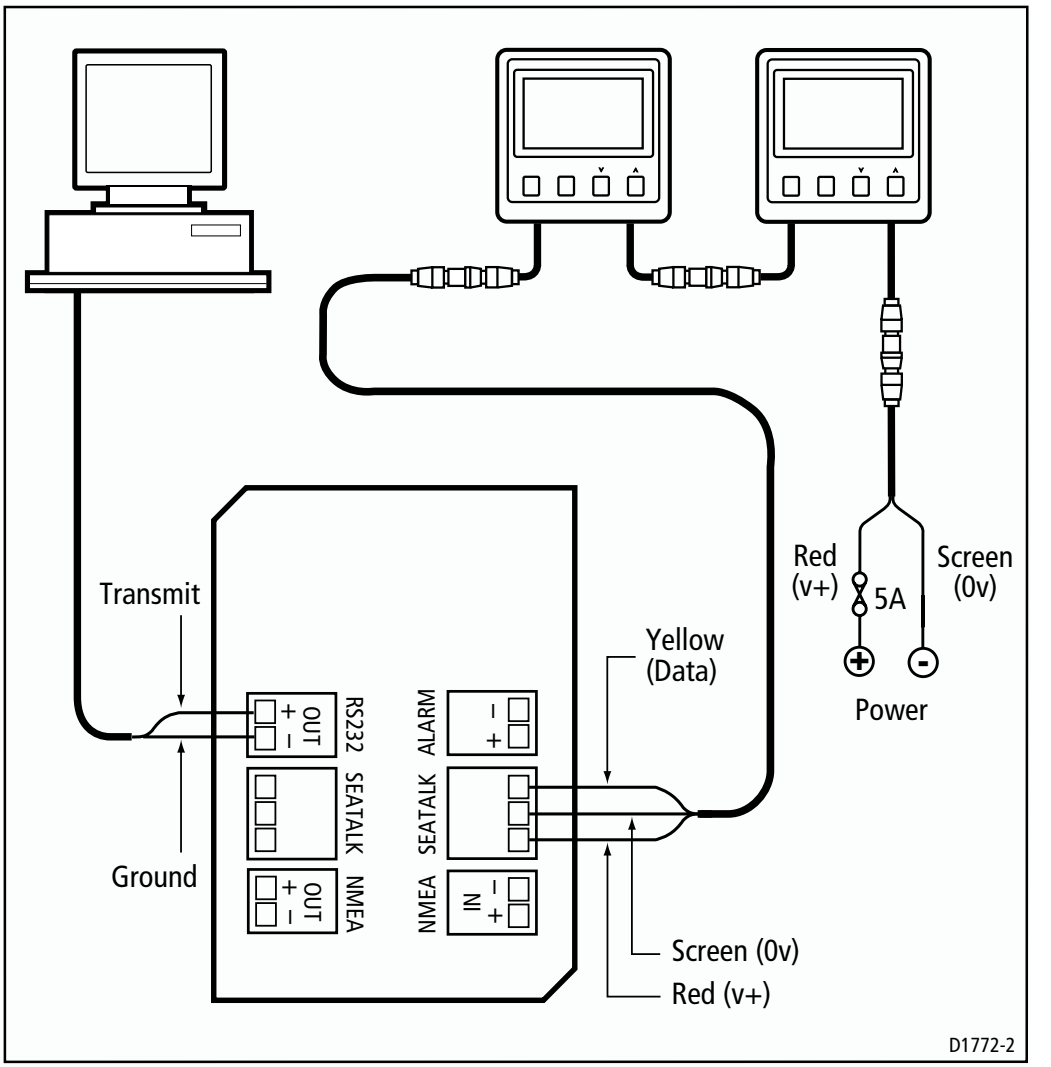
Cabling

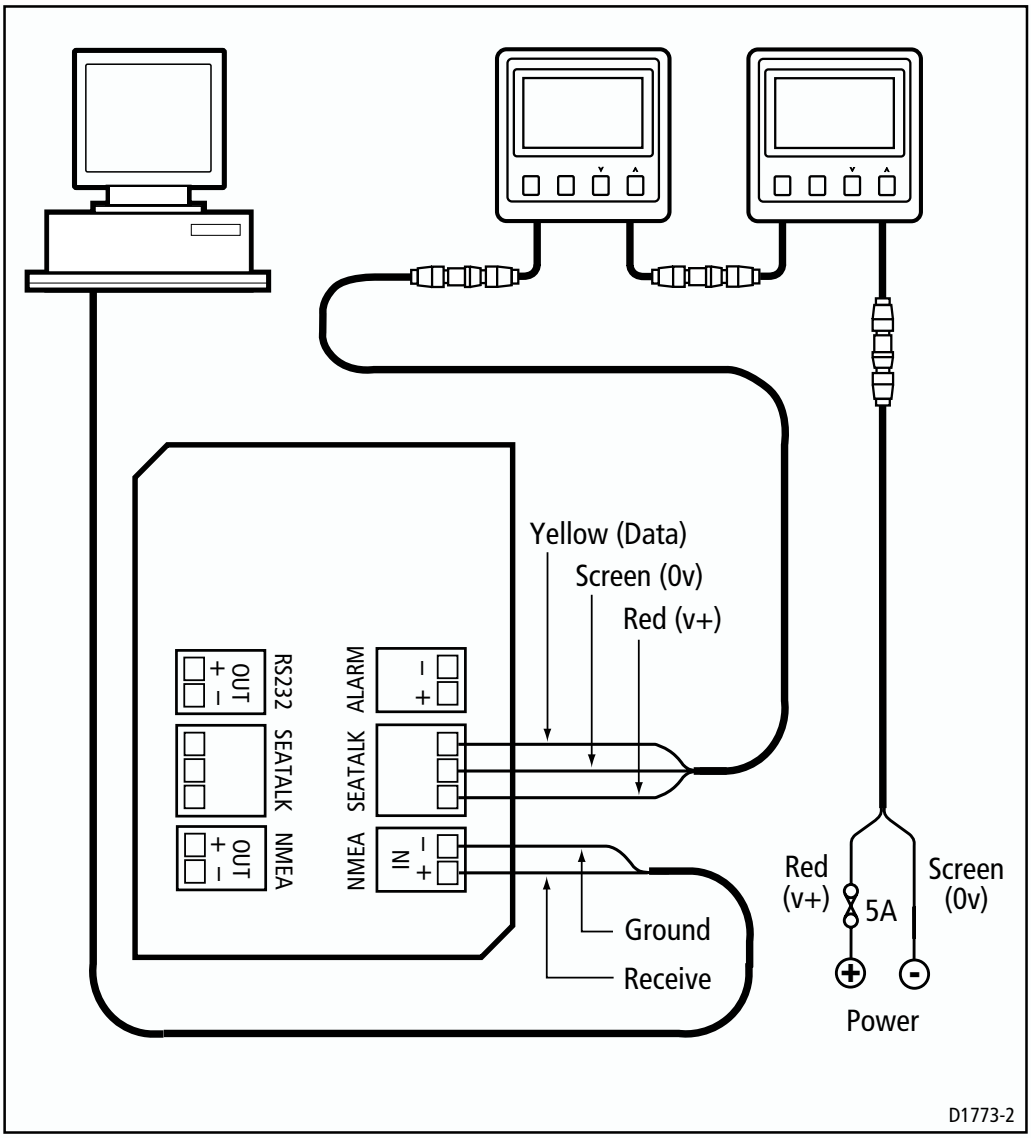
The Main Alarm should be wired to the PC/SeaTalk/NMEA Interface as follows:



3.4 Connecting a Personal Computer

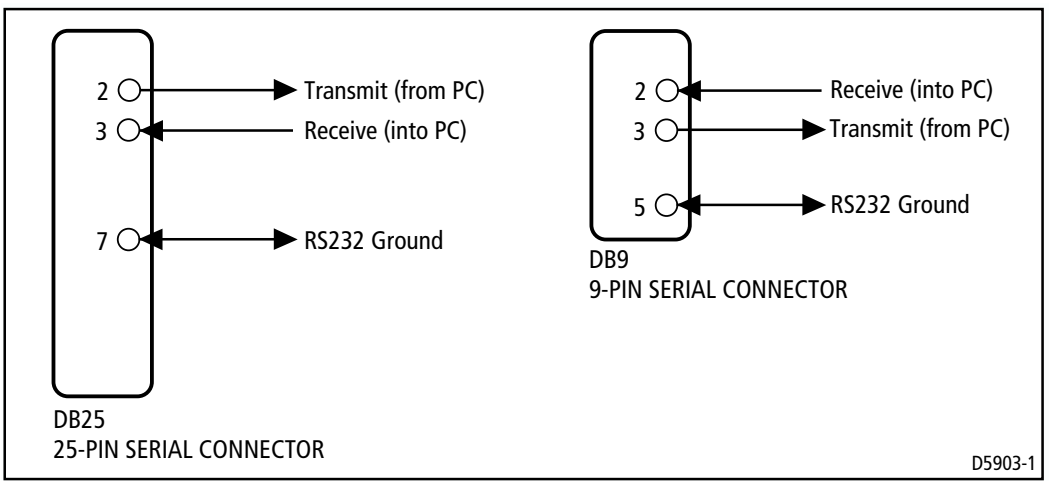
The PC/SeaTalk/NMEA Interface can be used to send or receive SeaTalk and NMEA data to or from a personal computer via the "RS232 OUT and NMEA IN" terminals, as shown in the following illustrations.




Yellow (Data)
Screen (0v)
Red (v+)
RS232
OUT
SEATALK
NMEA
OUT
ALARM
SEATALK
NMEA
IN
Ground
Receive
Red
(v+)
5A
Screen
(0v)
Power
D1773-2

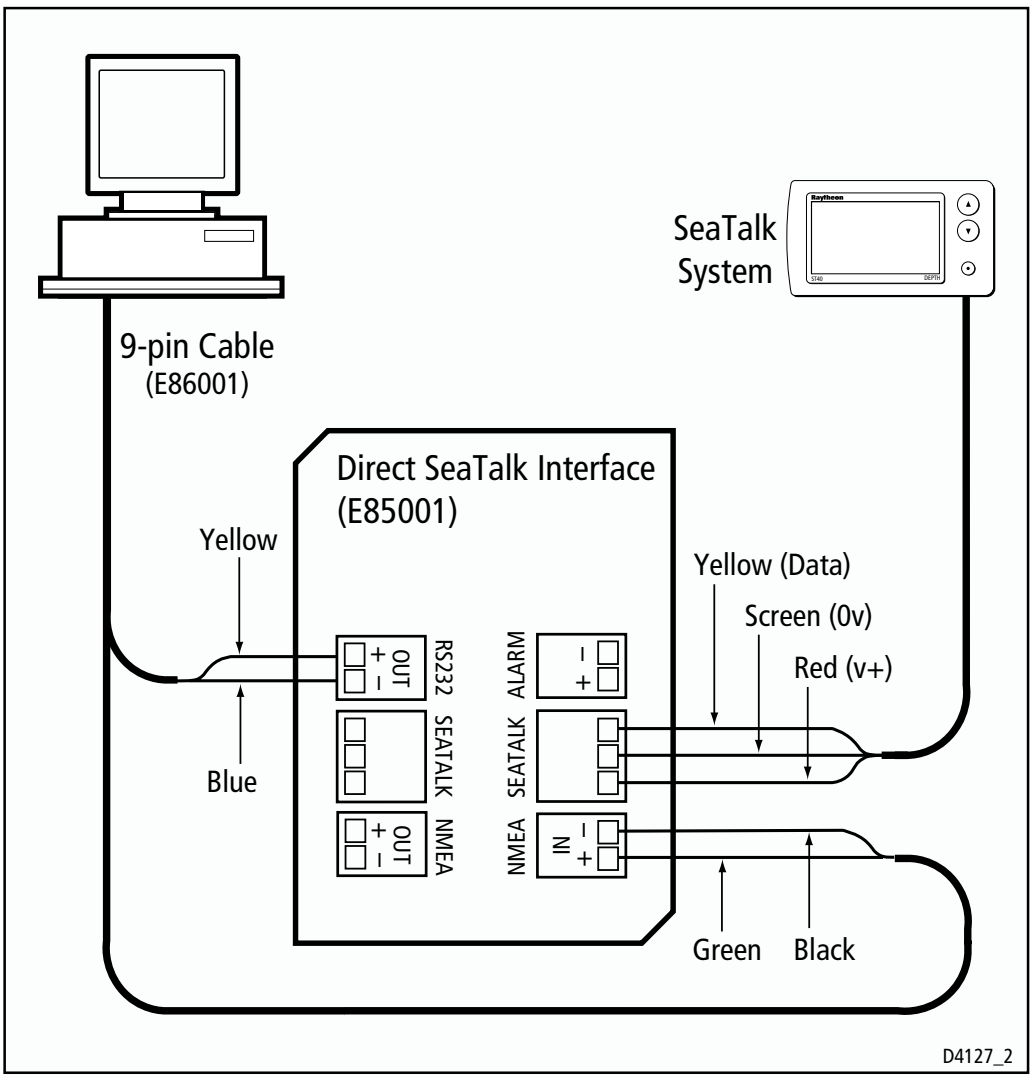
PC Serial Port Connections to NMEA

The following diagram shows the pin connections for 25-pin and 9-pin PC serial ports to NMEA.



3.5 Connecting to a PC with RayTech Navigator

The PC/SeaTalk/NMEA Interface can be used to connect a SeaTalk system to a personal computer equipped with RayTech Navigator charting software. Connection is via the "RS232 OUT and NMEA IN" terminals, as shown in the following illustration.



Chapter 4: Fault Finding

All Raymarine products are comprehensively tested prior to packing and shipment. In the unlikely event that a fault does occur, the following check list should help cure the problem.

Fault	Cause	Action
No operation	**No power supply**	**Check the SeaTalk bus connections are correct between the interface box and the power supply.**
NMEA data not converted and transmitted onto the SeaTalk bus.	**Equipment not set up to transmit correct NMEA sentences. Interface box incorrectly wired. Variable information such as XTE, bearing to waypoint, Lat/Lon already on SeaTalk bus.**	**Refer to manufacturers operating handbook. Check connections.**
Required NMEA information not transmitted from the interface box	**Information not present on the SeaTalk bus.**	**Connect required SeaTalk instruments.**
Main alarm does not sound	**30 second alarm delay applicable**	**Refer to section 3.4**

Servicing and Safety

- Raymarine equipment should be serviced only by authorized Raymarine service technicians. They will ensure that service procedures and replacement parts used will not affect performance. There are no user serviceable parts in any Raymarine product.
- Some products generate high voltages, so never handle the cables/connectors when power is being supplied to the equipment.
- When powered up, all electrical equipment produces electromagnetic fields. These can cause adjacent pieces of electrical equipment to interact with one another, with a consequent adverse effect on operation. In order to minimize these effects and enable you to get the best possible performance from your Raymarine equipment, guidelines are given in the installation instructions, to enable you to ensure minimum interaction between different items of equipment, i.e. ensure optimum Electromagnetic Compatibility (EMC).
- Always report any EMC-related problem to your nearest Raymarine dealer. We use such information to improve our quality standards.
- In some installations, it may not be possible to prevent the equipment from being affected by external influences. In general this will not damage the equipment but it can lead to spurious resetting action, or momentarily may result in faulty operation.